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17 July 1985

USSR Report

CONSTRUCTION AND RELATED INDUSTRIES

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USSR REPORT

CONSTRUCTION AND RELATED INDUSTRIES

CONTENTS

HOUSING CONSTRUCTION

NEW TRENDS IN RURAL HOUSING CONSTRUCTION

Multi-Family Housing Units

Moscow SEL'SKOYE STROITEL'STVO in Russian No 1, Jan 85 pp 13-16

[Article by G. Mazayev, head of the Division for Construction and Architectural Affairs of the Sverdlovsk Oblispolkom [oblast soviet executive committee]: "The Capacities of the Urban Base--For the Rural Area"]

[Text] The USSR Food Program specifies a sharp rise in the standard of living in the rural area. Outlined is "...introduction, at advanced rates, at kolkhozes, sovkhozes and other agricultural enterprises, construction of well-appointed housing with farm-service structures, pre-school institutes, clubs, libraries and other objects for cultural and everyday living purposes...."

For these purposes, up to 15 percent of the capacities of the urban house-building base has been authorized for use. This is a very large reserve to increase rural construction volumes, particularly for highly urbanized areas. Sverdlovsk Oblast is among these areas.

The oblast includes 11 plants of the USSR Ministry of Construction of Heavy Industry Enterprises and 10 plants of other construction ministries and departments which have considerable capacity for house production. Using 15 percent of the existing urban base for construction makes it possible to increase the rural building volumes 1.5-fold.

Housing construction in the rural area using the urban house-building base had also been carried out earlier, but urban 5-story buildings or 2-3-story buildings reduced from 5-story sectional houses were constructed. With the transition to construction mainly of farm-type houses, in Sverdlovsk Oblast they began, in 1982, to draw up plans for farm houses made of items from the oblast's urban house-building enterprises. In 1983 the RSFSR Council of Ministers and RSFSR Gosstroy held an All-Russian conference-seminar in the oblast on comprehensive building development and public services and amenities for the RSFSR rural settlements and showed some experimental buildings of this type there.

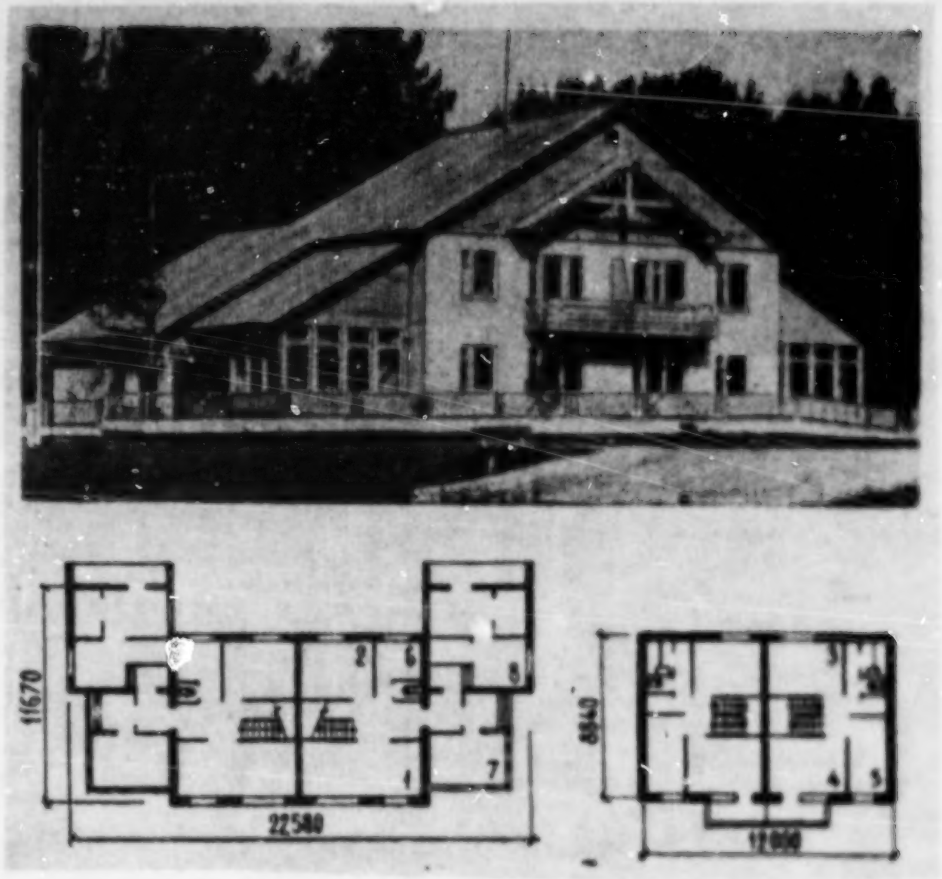


Fig. 1. Double-occupancy House on Two Levels. 1--living room; 2--kitchen; 3,4,5--bedrooms; 6--farm service facilities; 7--veranda; 8--farm-service unit

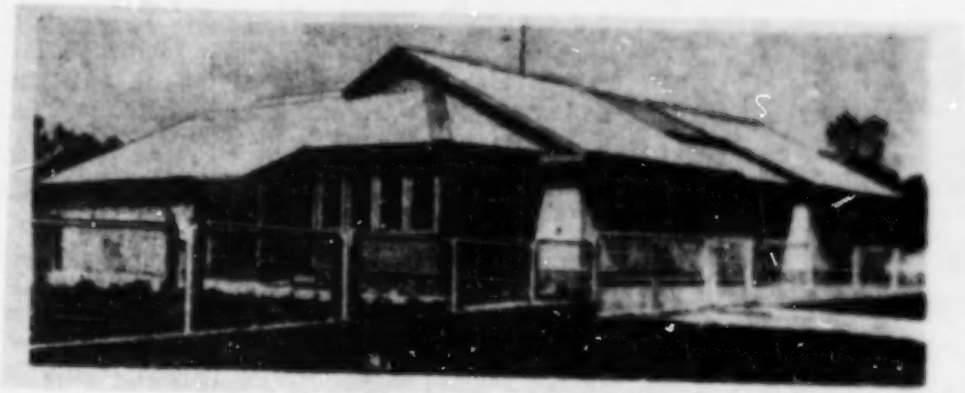
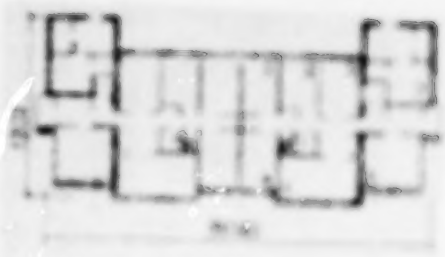


Fig. 2. [illegible]
1--living room; 2,3,4,5--bedrooms; 6--kitchen; 7--veranda; 8--farm-service unit

[Note: Room 5 appears to double as bedroom and kitchen -- ed.]



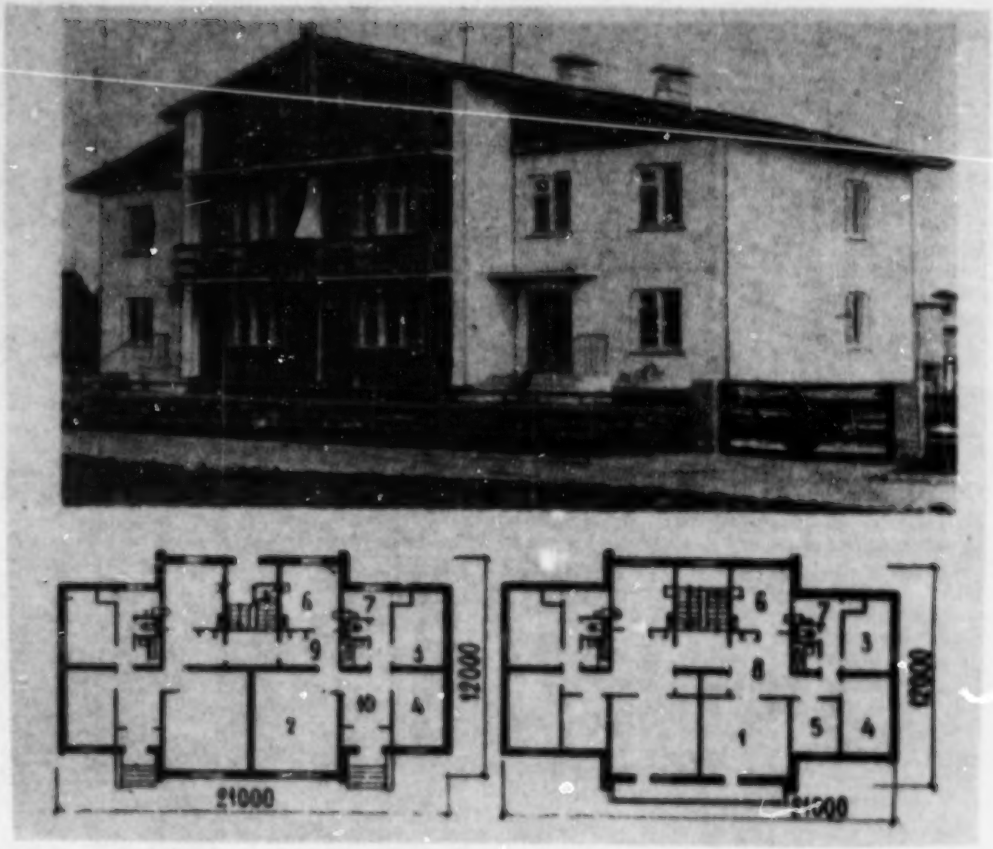


Fig. 3. Four-occupancy House. 1,2--living rooms; 3,4,5--bedrooms; 6--kitchen; 7--laundry room; 8,10--entrance halls; 9--hall

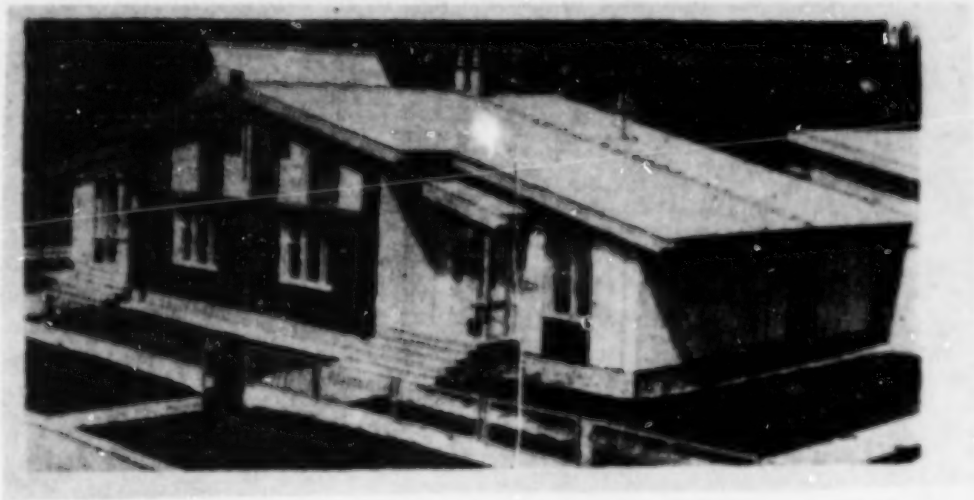
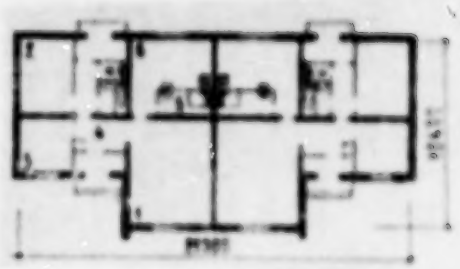


Fig. 4. Double-occupancy House. 1--living room; 2,3--bedrooms; 4--entrance hall and corridor; 5--laundry room; 6--kitchen



The Sverdlovskgrazhdanproyekt, UralZIEP, ORPTaNIIEPzhilishcha, TsNIIPzhilishcha (Moscow) and Uralgiprosel'khoztrov planning institutes developed eight types of houses, most widespread in the oblast, from the items: series 111-141--of the Sverdlovsk House-Building Combine (figs. 1, 2, 8), 111-97--of the Nizhnetagil'skiy House-Building Combine (fig. 3) and the Pervoural'skiy KPD [large-panel house-building plant] (fig. 4), 111-121 of the Uralenergostroy Trust Plant (fig. 5), 111-90-MU of the Verkh-Sevvinskiy Plant (fig. 7) and the detached apartment series (BKR) of the Verkhnesaldinskiy Plant (fig. 6).

The house (fig. 1), is large and impressive, reminding one of northern houses. The living quarters of the house, farm-service facilities, hayloft and veranda are combined under one roof. The exterior is finished with panels--the "decor" consists of colored, pebbled glass; the wooden parts are lacquered. The foundations are pile, with a solid raft foundation, the exterior walls are made of cellular concrete, the ceiling-floors are reinforced porous concrete slabs and the roof consists of asbestos cement sheets along wooden rafters. The living area is 98.34 square meters. The cost of the house is 42,110 rubles.

The house (fig. 2) has farm-service facilities connected through a vestibule. The extended facade is broken up by two projecting rhizoliths, in which the general rooms of the quarters are located. A small greenhouse is built into the roof, which is entered directly from the quarters. The skylight glass of the greenhouse in the roof is between the rhizoliths. The foundations, exterior walls, floors and roof are made of the same materials as in the house in fig. 1. The living area is 105.84 square meters. The cost of the house is 40,850 rubles.

The house (fig. 3) has a mixed planning structure: the quarters on the first floor are worked out in accordance with the farmhouse principle and have a direct entrance; the quarters on the second story are worked out on the sectional principle. The farm-service facilities are separate. The house is designed for development of centralized farms. The panels of the facade are finished with white marble aggregate and red polymer-cement. The wooden parts are stained dark brown, to similate lacquering. The foundations are drill-rammed piles, the walls are claydite panels, the ceiling-floors are flat reinforced concrete slabs and the roof is made of asbestos cement corrugated sheeting along rafter boards. The housing area is 195.4 square meters. The cost of the house is 59,390 rubles.

The house (fig. 4) has considerably increased entrance area, equipped with closets and storerooms and built-on farm-service facilities, with a connection through the open exterior area. The walls, ceiling-floors and roof are made of the same materials as in the house in Figure 3. The living area is 91.36 square meters. The cost of the house is 36,150 rubles.

In the house (fig. 5) the quarters are offset by a semi-story. The garage has been built in the middle section. The finishing elements--eaves and part of the gable--are made of brick and are brought out in the facade. The wooden parts of the facade are lacquered. The foundations are concrete blocks, the walls are clay-aggregate panels, the dividing walls are reinforced concrete and brick and the roof consists of asbestos cement corrugated sheets along wooden rafters. The living area is 90.44 square meters. The cost of the house is 47,000 rubles.

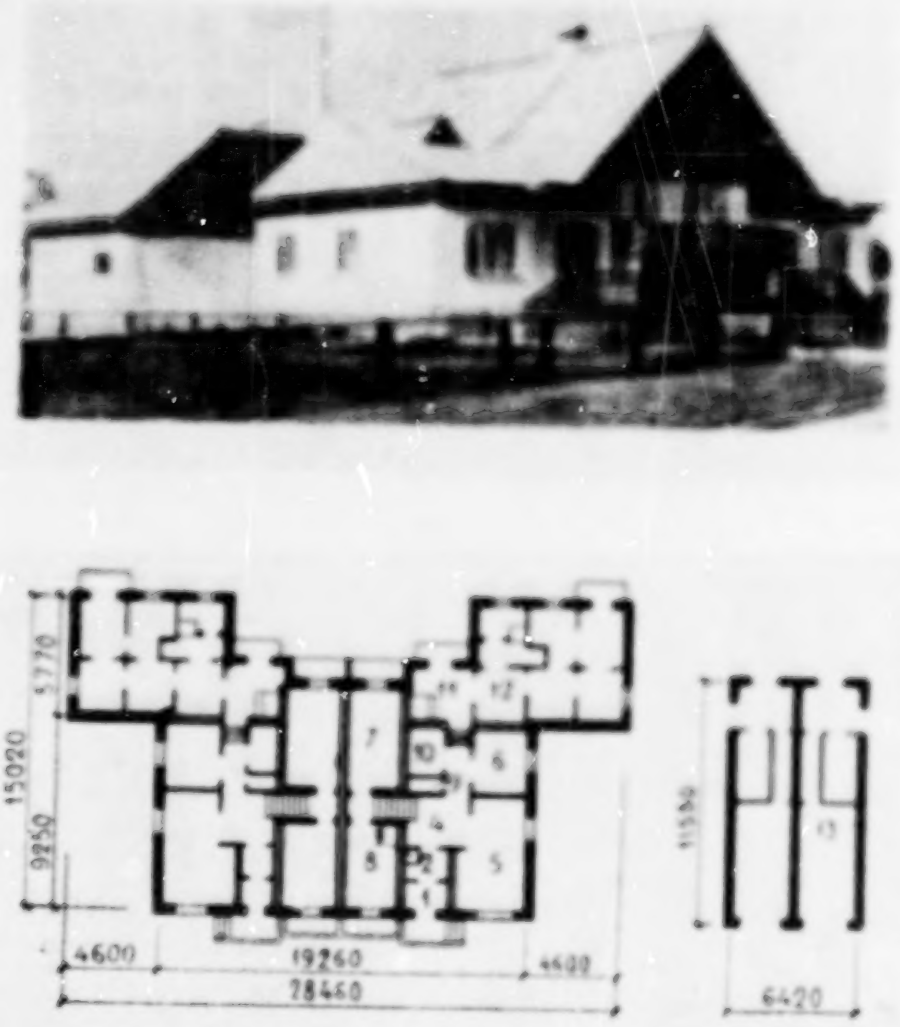


Fig. 5. Double-occupancy House. 1,11-vestibules; 2--hay storage; 3--drying cupboard; 4--entrance hall; 5--living room; 6--kitchen; 7,8--bedrooms; 9--lavatory; 10--bathroom; 12--farm service structures; 13--garage.

The house (fig. 6) has living quarters on three levels, combined into a semi-story. The staircase center has been successfully and beautifully resolved--one of the most integrated planning components of the multi-level quarters. The walls are light concrete panels, the ceiling-floors are reinforced concrete slabs and the roof is an attic made from sloping rafters. The supporting structures are reinforced concrete monolithic box units. The separate farm-service structure is linked with the house by a covered farm service yard, and it too is made of a box unit.

This experiment has confirmed the possibility of developing farm-type rural houses made from any structural elements produced by urban house-building combines. The living area of the house is 48.54 square meters. The cost of the house is 24,850 rubles.

The house (fig. 7) is connected with the brick farm-service facilities by closed passages. In addition to the verandas, the quarters have balconies made separate at the facade through color and decorative wooden elements. Decorative framed windows are also used here. The house foundations are columnar and made from concrete blocks, the walls are clay-aggregate panels, the floors are reinforced concrete slabs and there is a gable roof. The living area is 90.68 square meters. The cost of the house is 14,100 rubles.

The single-occupancy house (fig. 8) has a living area of 49.81 square meters. The foundations are block columnar, the walls are gas-ash concrete, the floors are wooden and the roof is an attic along wooden rafters. The cost of the house is 14,500 rubles.

The presence of finishing elements not included in the products list of the series items has become a feature of the planning developments and the completed construction. The volume-planning specifications of all the houses correspond to the series planning approaches. Some finishing elements required for structural reasons and the cornice elements in a house, in accordance with series 121 were done in brick and became architectural elements of the facade decor.

The service structures of the houses are made mainly from items of the initial cycle and gas-ash concrete wall panels.

Putting these basic considerations into effect has eliminated the need to manufacture additional forms and to increase the products list of plant-produced items, and has made it possible to keep all the essential assembly process at the construction site. All the houses have been made up only with plant series items.

Decorative elements made of wood and not intrinsic to industrial house-building were excluded from or kept to the minimum in the architectural treatment of the houses; industrial methods developed by the plants were used in the facade finishing. As a result, houses were obtained that have a contemporary look, without the retrospective elements of decor so prevalent of late.

The search for originality and architectural expressiveness of the houses has been conducted, not on the basis of the exterior decor, but on the basis of considering the local traditions of the national architecture and the traditional volume-planning structures of national housing.

The predominant number of houses are designed on the principle of a unitized housing-farming complex, in which the housing and farming sections are connected by a system of utility facilities, vestibules or enclosed farming yards.

It was established in the course of the planning that the most essential shortcoming of farm houses made of items from the urban series is the large expenditure of heavy concrete, which makes their construction more expensive. In the standard series the supporting scheme is based on transverse walls made of heavy concrete. It is inexpedient to use this structural scheme in a farm house, since in 1-2-story houses the supporting capacity of the enclosing panels proves to be sufficient.

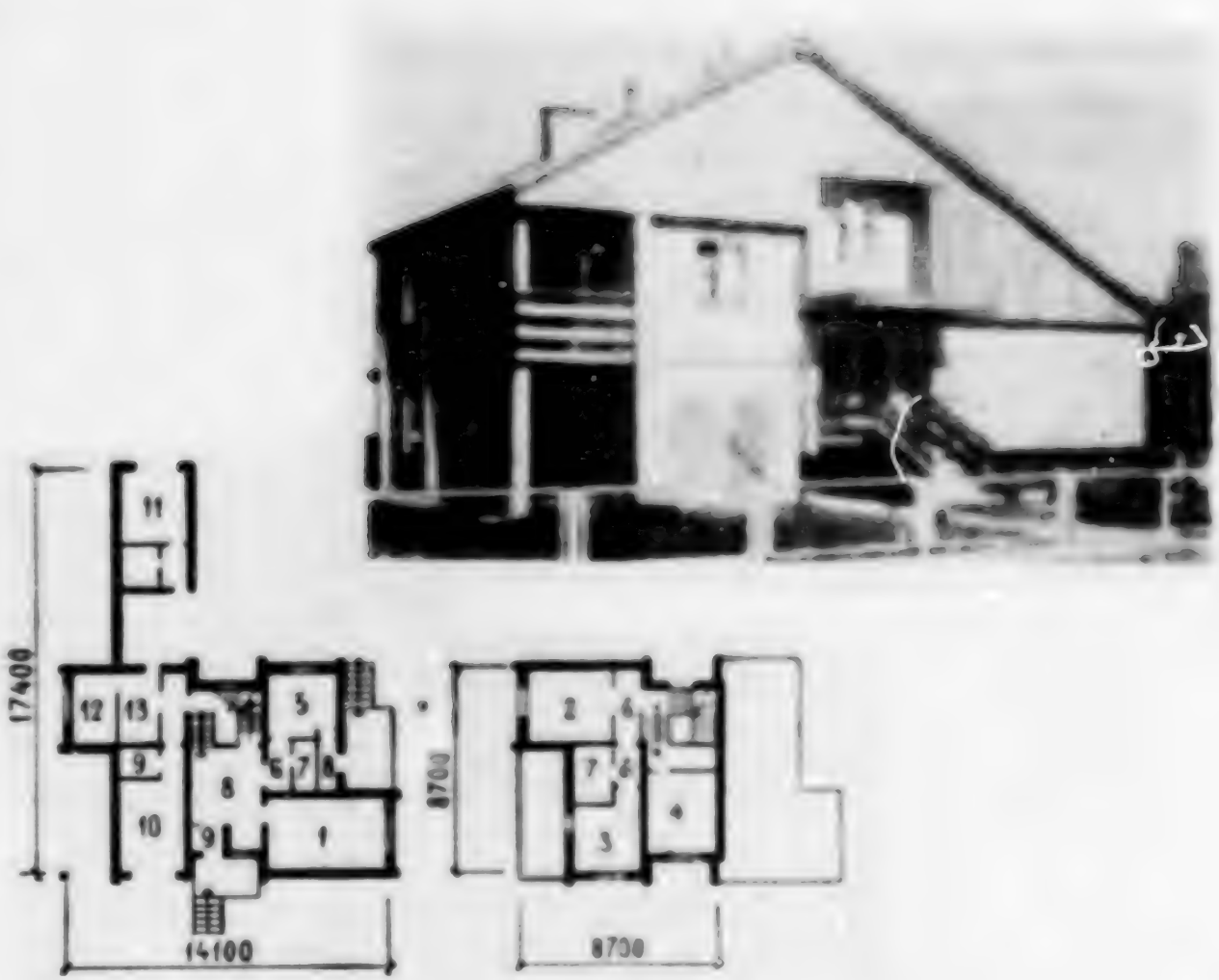


Fig. 6. Single-occupancy House. 1--living room; 2,3,4--bedrooms; 5--kitchen; 6--hall; 7-bathrooms; 8--entrance hall; 9,12--storerooms; 10--garage; 11--livestock pen; 13--feed preparation room.

Engineer O.I. Lobov suggested that interior partitions made of heavy-weight concrete be eliminated and that the supporting capacity of the bathroom unit be used. A home such as this was constructed in accordance with a plan from the Sverdlovskgarzhdanproyekt Institute in the Baltym settlement (fig. 6). It has a very compact planning structure, and, with respect to the exterior appearance, corresponds to the traditional Ural house. The outside shape of the walls is formed by self-supporting gas-ash concrete panels of series 141. The sturdiness of the walls is ensured by a bathroom unit located in the center of the house. It is this stucture that takes on the load from the ceiling. Experimental construction has shown that the cost per square meter of housing in it is 177 rubles, whereas the average cost in other houses made from urban series items is 220-230 rubles.

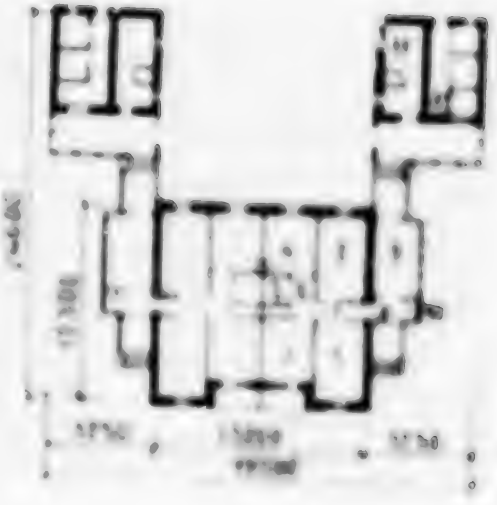


Fig. 7. Double-occupancy House. 1--living room; [illegible]
4--kitchen; 5--washroom; 6--hall; 7--entrance hall; 8--[illegible]
9--veranda; 10--storeroom; 11--bathroom; 12--livestock pen

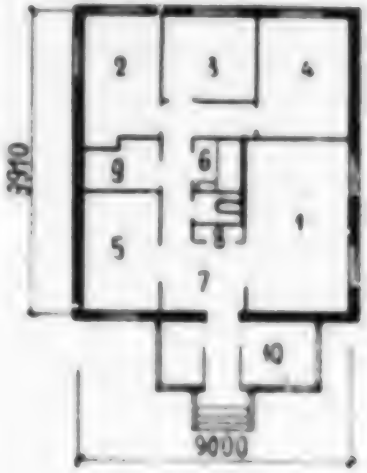


Fig. 8. Single-occupancy House. 1--living room; [illegible]
7--entrance hall and hall; 8-closet; 9--[illegible]

This structural principle of a "central supporting unit" is the most expedient and it is on tne path of developing this principle that economical farm houses, simple to construct, may be produced.

At present the Sverelovskgrazhdanproyekt Institute is developing a series of four types of houses with a supporting bathroom unit, which will make it possible to design the complete development of rural population centers.

Diagrams of the plans for two houses from this series are shown in fig. 9a and b, which shows the structural elements: shaded--gash-ash concrete panels; black color lines--elements made of heavy-weight concrete, and unshaded areas --gypsum concrete partitions. A minimal number of series items are in the house: in the double-occupancy--14 panels of 4 types, and in the single-occupancy on two levels--10 panels of 4 types.

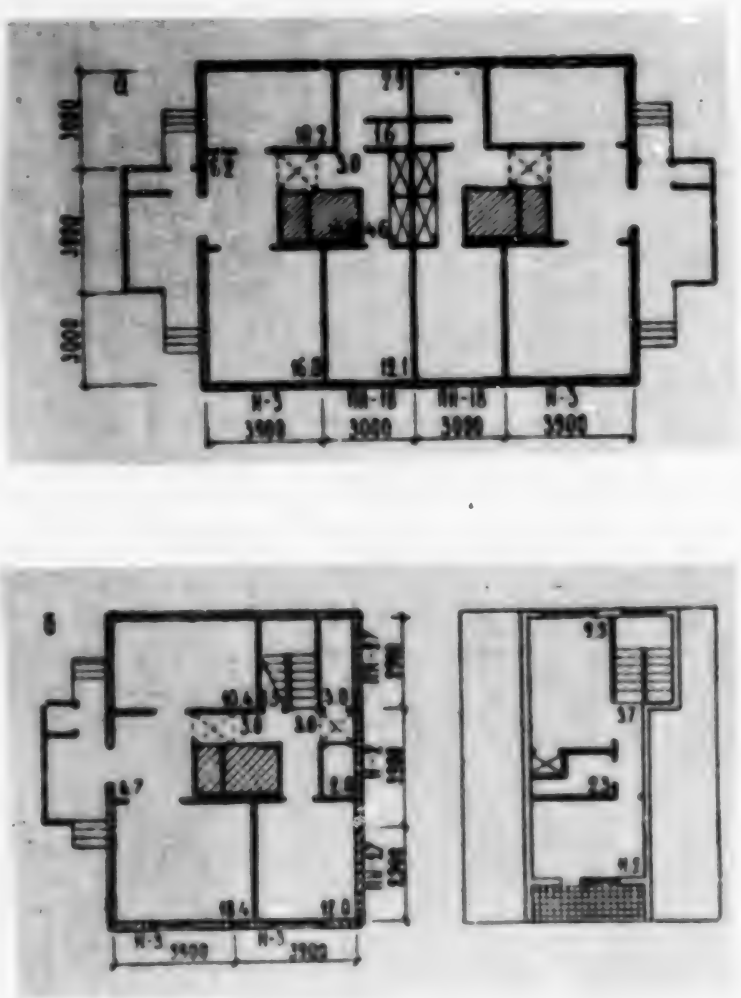


Figure 9.

The living space of the double-occupancy house is 56.2 square meters, and of the single-occupancy--50.88 square meters.

In our opinion, houses with a "central supporting unit" are the most promising way to develop houses of the farm type on the basis of urban house-building combines. In practice it will make it possible to construct houses made from items of any series and will be actively introduced.

By decision of the Sverdlovsk Oblispolkom, all urban enterprises have been assigned to regions of the oblast, in order to eliminate expensive transport of items at considerable distances, after the construction has been concentrated in groups. For this purpose, each enterprise must be provided with a series of plans for rural houses, ensuring comprehensive building development of villages. This is because of transition from the planning of individual house-samples to house series, to be constructed according to the principle of a "central supporting unit."

In constructing new house-building combine plants, the development of rural houses made from their items will become compulsory in the oblast. Because of this, the plans of the Sverdlovskgrazhdanproyekt Institute yearly include the subject of standard planning for the rural area.

In 1984 the use level of the Glavsredurapstroy industrial base for rural areas was 7 percent, and in 1985 it will be brought to 14 percent.

Duplexes for Northern Regions

Moscow SEL'SKOYE STROITEL'STVO in Russian No 1, Jan 85 pp 17-18

[Article by V. Andreyev, candidate of Technical Sciences and L. Malofeyeva and S. Zelikin, engineers: "Houses for Northern Rural Areas"]

[Text] The method of block-unit construction, which has become wide-spread in our country, makes it possible to transfer 80 percent of the overall labor input to plant conditions and to reduce accordingly, by 1.5-2.5-fold, the labor-intensiveness of the work done at the construction site.

Many of the low-storied residential buildings, as well as farm-type houses, made of monolithic reinforced concrete block-units of the "horizontal tumbler" type have been erected in Krasnodarskiy Kray. In accordance with plans drawn up by TsNIIEPzhilishcha [Central Scientific Research and Planning Institute of Standard and Experimental Planning of Housing], villages and regional centers are being developed from them.

This advanced experiment in construction is extremely necessary and fully feasible in the northern regions of our country, primarily in the Komi ASSR, where three block-unit house-building shops are in operation at reinforced concrete item plants--in the cities of Ukhta, Pechora and Vorkuta. Each shop turns out sets of monolithic reinforced concrete block-units for low-story residential and technical-service buildings.

The northern branch of VNIIST [All-Union Scientific Research Institute of Sanitary Engineering], in collaboration with TsNIIEPzhilisha, is doing what it can to help in rebuilding the northern villages. They developed 20 variants of designs for double- and single-occupancy residences and farm-service structures which take into consideration the special features of developing the northern villages.

The planning proposals provide for architectural-planning and structural solutions, with maximum use of block-units and finished reinforced concrete elements produced by reinforced concrete item plants.

The two-story houses (figs. 1, 2) are designed with quarters on two levels. The first floor provides the main entrances, with a double vestibule (1), summer facilities (2) and emergency exits to the farm section through the summer facilities or directly from the kitchen (3). Through the entrance way (4), where the staircase is located, or through the inter-communicating room (5) there is connection with all the other rooms on the story--kitchen, bathroom and living room (6), which can be used as a guest room-dining room. Storerooms and built-in closets are located on the first floor and a place is allotted for the gear of those entering. The second floor is linked by an inter-quarter staircase and consists of living rooms (6) and a bathroom. In the one-story single-occupancy (fig. 3, designations of the facilities same as in figs. 1, 2) and double-occupancy houses, provision is made to divide the facilities into daytime use and sleeping rooms. The entrance is planned through a unit in which the cold storage rooms and a built-in closet for work-clothes storage are located. The hall for each apartment is formed by the separation of the units. A space is assigned in the bathroom for a washing machine.

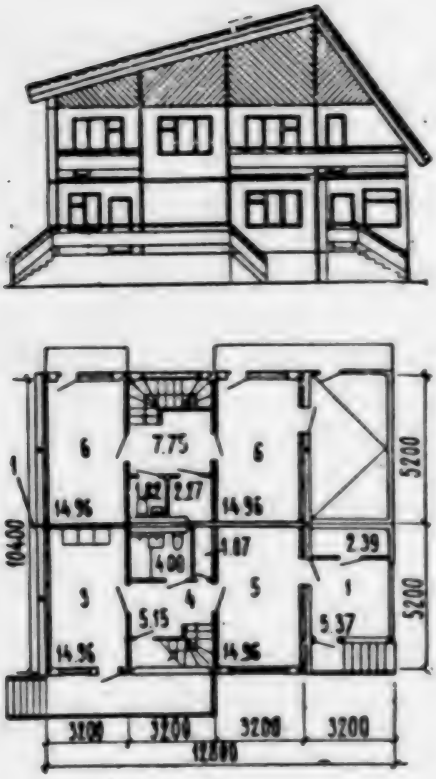
The structural designs for the buildings are unitized or unit-panel. The basic supporting and enclosing element is the unit block of the "horizontal tumbler" type, 3180 X 5190 X 2690 millimeters with a suspended exterior wall panel made of claydite concrete.

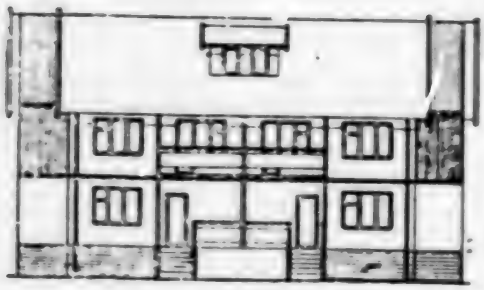
Two types of units are used with respect to their purpose and planning resolutions: the first is a residence unit-room, and the second--a bathroom-kitchen unit.

The story support of the units is linear, along lengthwise ribs. With the unit-panel design of the building, the blocks are separated and the space between the blocks is covered with flat slabs. The inter-quarter staircases are made of wood, and are 0.9 meters wide. The roof is a separate structure made of precast reinforced concrete components or a loft with wooden rafters and roofing material made of corrugated asbestos cement sheets.

The rough estimated cost of the block-unit houses for rural construction is from 25 to 60,000 rubles.

The labor input for building is 1.85 man-days per square meter of adjusted area, while for similar buildings made of large panels it is 2.9, large block --3.7 and brick--4.6 man-days.





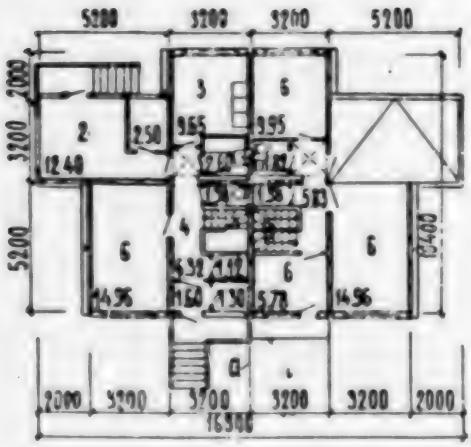
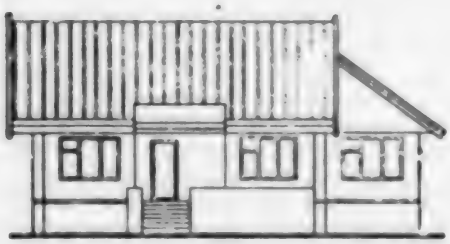


Fig. 1.

Fig. 2.



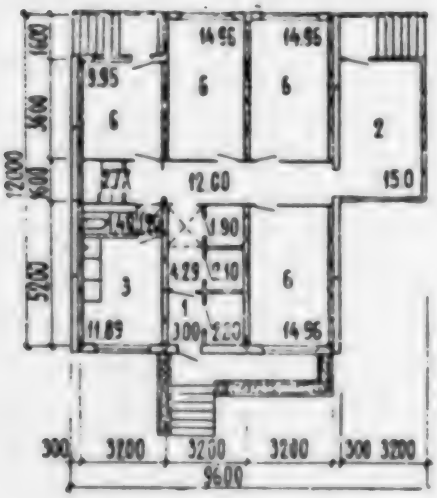
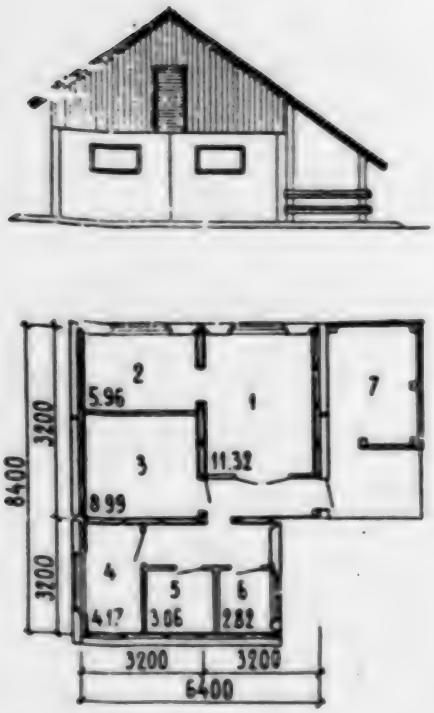


Fig. 3.



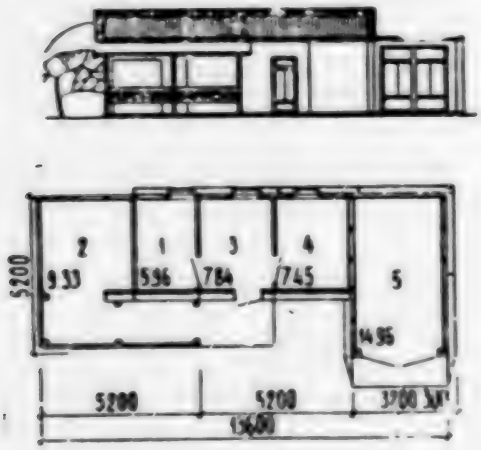


Fig. 5. 1--storeroom; 2--shed; 3--supply room; 4--woodworking shop; 5--garage.

Fig. 4. Facilities for: 1--cows; 2--calves; 3--pigs; 4--poultry; 5--fodder storage; 6--supply room; 7--fuel shed

In addition to reducing the labor input at the construction site, which is extremely important for the northern regions with their severe climatic conditions, the block-unit method makes it possible to solve yet another complex problem, inherent in rural construction: fulfilling the basic special assembly and finishing work under plant conditions.

Figs. 4 and 5 show farm-service structures made from block units.

12151
CSO: 1821/127

HOUSING CONSTRUCTION

WIDER USE OF LARGE-PANEL 'MOBIL' SYSTEM URGED

Moscow BYULLETEN' STROITEL'NOY TEKHNIKI in Russian No 11, Nov 84 p 9

[Article: "Concerning the Use of the 'Mobil' Series in Building Housing Units"]

[Text] The staff of USSR Gosstroy examined the question "Concerning the Efficient Sphere of Using the 'Mobil' System of Large-Panel Housing Units" which was developed by the Kiev ZNIIEP [Plant Scientific Research Institute for Experimental Design] on 17 July 1984. It was noted that the use of this system makes it possible to reduce the industrial products list needed for building housing units by a factor of 2.5 to 4 in comparison with the existing series of typical designs, substantially improve the effficiency of large-panel housing construction, and ensure that modern urban development requirements and architectural expressiveness for building housing regions are met. The "Mobil" system can be used most effectively at small and medium capacity large-panel housing construction enterprises.

The Kazakh SSR Gosstroy, the USSR Ministry of Construction of Heavy Industry Enterprises, the Ministry of Eastern Construction and the Baku city ispolkom are adopting this system in housing construction practice.

The USSR Gosstroy staff approved the positive experience of the "Mobil" system in housing construction when it was being worked out by the Kiev ZNIIEP Institute and used by the Kazakh SSR Gosstroy, ministries and departments. Union republic gosstroys are recommended to organize a program to familiarize specialists in design institutes and urban architectural and planning administrations with the "Mobil" system and its use in housing construction.

The USSR Gosstroy staff proposed that the State Committee for Civil Construction and Architecture:

approve the list of designs for the "Mobil" system series that was developed by the Kiev ZNIIEP and ensure that typical designs for these series are worked out in 1984 to 1988 for various climatic regions and building conditions;

organize the design and construction of model housing rayons that use "Mobil" system housing units in various parts of the country, examine the question of organizing revisions to existing designs and working out new series of typical

designs for large-panel housing units keeping in mind the necessity of drastically reducing the products list in these designs.

The Main Construction Design Administration, the Department for Typical Designs and Organizing Design and Research Work, the State Committee for Civil Construction and Architecture and PI-2 [Design Institute 2], while enlisting the aid of the USSR Ministry of Construction, Road and Municipal Machine Building and the USSR Ministry of Installation and Special Construction have been assigned the task of ensuring that a typical design is worked out in 1984-1985 for a large-panel housing construction plant that can be assembled quickly using lightweight components that are delivered in complete units and having a capacity of 70,000 square meters of general floor space per year.

9495
CSO: 1821/123

HOUSING CONSTRUCTION

BRIEFS

NEW HOUSING CONSTRUCTION DESIGNS--Latvian architects are appealing to the diverse tastes of rural residents by working out individual housing. The republic's Gosstroy has issued a Combined Catalog for One and Two-Story Housing Units with terraces and balconies made of brick and block. The conditions of the various climate regions, topography, ground water level and local building material resources were taken into consideration in each design. A construction assistance service operating in all regions is at the disposal of individual builders. New dwellings for more than 20,000 people are being added to the Latvian economy. [TASS] [Text] [Moscow STROITEL'NAYA GAZETA in Russian 16 Dec 84 p 2] 9495

VLADIVOSTOK DEVELOPMENT PLAN--Six hundred thousand people have been born in Vladivostok--the largest city in the eastern region of the country today. It will mark its 125th Anniversary this year. A new general plan for urban development has just been approved. It is notable that no more new industrial enterprises are intended to be built within its boundaries. Primary attention is being given to housing construction and to developing the muli-faceted social and service infrastructure. New microrayons are only being built as a complete package. Two of these "Ptoraya Rechka" and the former "Koreyskaya slobodka" were awarded USSR Council of Ministers Prizes for the design and quality of the construction. The city is starting "to crowd" the end of the Murav'yeva-Amur peninsula that juts out 30 kilometers into the Sea of Japan. Therefore, in the near future a multi-story fellow city will arise next to it among the volcanic peaks in the pastoral forest zone near the banks of the Ussuriysk and Amur straits. About four million people will live in it. [By Yu. Ralin] [Text] [Moscow STROITEL'NAYA GAZETA in Russian 11 Jan 85 p 2] 9495

CSO:1821/123

CONSTRUCTION MACHINERY AND EQUIPMENT

UDC 69.002.5:061.3

DEVELOPMENTS IN CONSTRUCTION MACHINERY VIEWED

Utilization of Equipment Mismanaged

Moscow MEKHANIZATSIYA STROITEL'STVA in Russian No 12, Dec 84 pp 4-6

[Article by Engineers A. V. Besschastnyy (State Construction and Installing Association No 1 of Glavmospromstroy [Main Administration for Industrial Construction of the Moscow City Soviet]), V. A. Voloshin (USSR Gosstroy), and V. V. Ruleva (Moscow House of Scientific and Technical Propaganda imeni F. E. Dzerzhinskiy): "Comprehensive Mechanization of Operations and Engineering Preparation Therefor"]

[Text] In June 1984 the Moscow House of Scientific and Technical Propaganda imeni F. E. Dzerzhinskiy held a seminar under the slogan "Integrated Mechanization of Construction Needs Engineering Preparation " in which specialists of the USSR Gosstroy's Mechanization and Automation of Construction Section, construction ministries and agencies and Mosgorispolkom [Moscow City Ispolkom], and scientific staff workers of TsNIIOMTP [Central Scientific-Research and Experimental-Design Institute for the Organization and Mechanization of and Technical Assistance to Construction], VNIPItrud [All-Union Scientific-Research and Design Institute for Construction Work] and VNIIAlmaz [All-Union Scientific-Research and Industrial-Design Institute for Natural Diamonds and Diamond Tools] took part.

The chief of a subdivision of the USSR Gosstroy Mechanization and Automation of Construction Section, N. D. Timofeyev, gave a brief survey of the basic directions in the development and stated the goals of the integrated mechanization of construction work. He noted that the country had stated a decisive and extraordinarily important goal for the five-year plan. In the first three years of the 11th Five-Year Plan, the builders made a substantial contribution to national economic development. During this period fixed capital costing 418.1 billion rubles had been put into use, and more than 300 million m^2 of total housing space had been built. The total amount of construction and installing operations carried out exceeded 210 billion rubles' worth.

Mechanization played a leading role in the increased effectiveness of construction work. Furnished to construction were 28,900 excavators, 28,500

bulldozers, 37,100 jib and tower cranes, 157,800 finishing-work machines and 208,000 vibrators. The total inventory of basic construction machines now is 820,000 units. More than 1.2 million men are engaged in the operation and technical servicing of these machines.

The structure of the construction machinery inventory also improved, through increased deliveries of new types of hydraulic cranes with telescoping booms and hydraulic excavators (the share of which rose to 43 percent of the total fleet of these machines), hydraulic hammers for excavating solid rock, plastering and painting stations, high-pressure painting units, electric rotary-percussion punches and other mechanized equipment.

The use of concrete-pump and concrete-mixing trucks for doing concreting work, special installations for laying cast-in-place piles and for erecting structures by the "wall-in-the-soil" method, and other machinery which allowed new, more improved methods for performing mechanized operations to be introduced, expanded.

The construction ministries and agencies, which each year produce machines, equipment, rigging and tooling valued at more than 1.5 billion rubles, are making a substantial contribution to developing the mechanization of construction. Basically, this means mechanized equipment whose output industry itself has not mastered or organized in adequate amounts.

As a whole, labor consumption in contracting construction and installing operations was reduced by 182,000 men in 1981-1983 through the mechanization of construction and installing work, allowing labor productivity to increase by more than 2.7 percent.

At the same time, the state of affairs in the development of construction mechanization cannot be considered satisfactory and, as was noted at the April 1984 CPSU Central Committee Plenum, we cannot "do without a further rise in the vigor of our economic work" here.

The main thing remains the question of increasing the utilization effectiveness of construction equipment and of equipping the industry with modern and highly effective machinery. And the recently issued CPSU Central Committee and USSR Council of Ministers Decree about improving the planning, organization and management of capital construction was aimed at solving this problem.

The results of the first three years of the 11th Five-Year Plan testify that growth in productivity of basic construction machinery lags behind five-year plan goals, and in some construction ministries even a reduction in the output of them is observed. Construction machinery time is not being utilized satisfactorily, with construction machines averaging 10-12.5 hours of work per day. Large losses of equipment time are associated with unsatisfactory use of construction equipment within shifts, which runs up to 16.1 percent.

The main causes of unsatisfactory machinery utilization are deficiencies in the organization and technological preparation for doing the work, late delivery of materials, parts and structure, and labor-discipline violations. Machinery downtime because of interruptions in the supplying of fuel, lubricants and electric power has increased.

The matter of delivering spare parts, as well as mobile equipment for the technical servicing and repair of machinery, and unsatisfactory use of the tool activity and of small-scale mechanized equipment remains severe, as before.

The speaker told about the main directions for improving utilization of the construction-equipment inventory in contracting construction and for improving the planning work and mutual relations of subunits of mechanization and construction organizations. It was noted that cases occur locally where the established procedure for formulating the production program of mechanization trusts (and administrations) is violated. The very same planning principles that apply to general construction organizations also govern these specialized organizations. As a result, violations are committed in establishing work indicators and goals for reducing the prime costs of performing the operations. These affect adversely the level of construction-equipment utilization.

In order to regularize the matter of the planning and mutual relations of general construction organizations and mechanization trusts (or administrations) in orderly fashion, the Scientific-Research Institute of Construction Economics is now working out a standard statute which will recommend a rise in the mutual motivation of general-construction and specialized organizations to improve utilization of the machinery fleet and to reduce labor expenditure in construction.

It is necessary also to improve the economic mechanism of management, to put in order computations for the mechanized operations performed, to introduce more widely progressive forms of wages for the operation of machines and for the haulage, technical servicing and repair thereof, and to regularize plan-estimated prices for use of the equipment.

An important prerequisite to effective construction-machinery utilization is the further improvement of work organization and the introduction of progressive ways and methods for doing the work.

Such an effective lever as the inclusion of equipment operators in the construction brigades still is not being used adequately. The practice of including equipment operators and motor-transport drivers in integrated brigades that operate under a single work order and geographic plot substantially increases their motivation toward the final result of their work and develops mutual assistance. The utilization of equipment is better where it has been concentrated in large mechanized brigades and teams.

Construction mechanization effectiveness depends greatly upon the machine-builders, most of all on Minstroydormash [Ministry of Construction, Road and Municipal Machine Building].

The existing structure of the construction-machinery pool does not satisfy the needs of construction work and restrains labor productivity growth. Thus, the share of bulldozers based on tractors of the 3-ton class should be 12 percent of the total fleet of such vehicles (it is actually 43.6 percent), of bulldozer-rippers based on 25-ton class tractors--10.4 percent (actually it is 1.2 percent), of truck cranes of 6.3 tons' lifting capacity--15.4 percent (it is actually 55.5 percent), and of truck cranes of 10 tons or more of

lifting capacity--84.6 percent (it is actually 44.5 percent). The situation is similar in regard to tower and jib cranes, scrapers and other types of equipment. Specialists have estimated that if the construction equipment fleet is brought up to its optimal structure, the total number of units could be reduced by 99,200 and the number of operators by 147,000, while maintaining, in so doing, the total volume of construction work performed.

The machinebuilding ministries and the planning organs should review the equipment production plan with a view to bringing the equipment fleet into correspondence with the optimal structure.

Although the production of mechanized tools has been expanded recently, construction's requirements for construction-finishing machines are being satisfied by only 60.5 percent, for mechanized tools by only 48.1 percent.

Special attention should be paid to the mechanization of roofing, concreting, plastering and painting operations, work on the erection of industrial-production equipment, and the laying of floors, where large amounts of manual labor are still being employed. The quality and the operating potential of construction machinery also should be improved.

Because of the increase in the amounts of work in remote regions, expenditures and time for redeploying construction machinery have risen. The solution of this problem involves development of the production of mobile construction machinery as well as of mobile equipment for technical servicing and repair. The design of cranes, especially for the erection of high-rise buildings, should be improved with a view to reducing machinery time spent on vertical transport. The movement of huge masses of soil remains a serious problem. Because of construction's lack of large-load earthmoving vehicles, the time spent preparing for construction exceeds, as a rule, the prescribed time.

Construction needs equipment that is not just highly productive and reliable. It should be economical. Unfortunately, the cost of the equipment rises more rapidly than its productivity. Thus, while the construction-equipment fleet in contracting construction rose by an average of 10 percent during the 11th Five-Year Plan, its book value increased 40 percent. In so doing, practically no growth in unit capacity of the machinery was observed. The relative rise in expensiveness of the machinery fleet is 4-5 percent per year. This undesirable trend leads to increased cost of construction work and it degrades the qualitative indicators of construction operations.

In resolving the problem of further developing and improving comprehensive mechanization of construction and installing work, equipment operators should provide for fulfillment of the basic mission--that of raising labor productivity in construction during the 11th Five-Year Plan through the "mechanization" factor by 4.6 percent. The potential for this exists.

G. K. Maltyzov, chief design developer of Glavmosinzhstroy [Main Administration for the Construction of Engineering Structures in Moscow City] under the Moscow City Ispolkom, told in his report about certain small mechanized equipment developed in its SKB [Special Design Bureau] that is being used widely at the main administration's projects.

In recent years, he noted, a trend has been observed in the USSR and the U.S. toward creating general-purpose road-construction machines. A characteristic

feature of machinery in this category is the presence thereon of several implements which are in constant readiness for operation. Moreover, more often than not they are equipped with interchangeable implements.

The SKB has developed a set of toolbar equipment for the T-25A tractor that consists of a blade with dumping tines, a scoop, a centrifugal pump for pumping out water, and a device for the installation and removal of manhole covers. The set is intended for earthmoving, loading, unloading and transporting work at city construction jobs. With the toolbar equipment installed, the T-25A tractor is transformed into a general-purpose road-building machine. Series production of the equipment for it has been mastered at Glavmosinzhstroy's road-machinery repair plant.

By using the T-25A tractor with a set of toolbar equipment at jobs that build engineering facilities, the following have been mechanized in Moscow: the distribution and laying of curbstone, concrete, sand and gravel, constructional structure and parts (asbestos-cement pipes and slabs) along roads; pumping water out of trenches, excavation pits and holes; leveling sand, gravel and soil; collecting and removing construction trash and waste; and removing and installing manhole covers during the construction and repair of road toppings.

M. Yu. Bondar', chief engineer of the Odessa Construction-Finishing Machinery Plant, told seminar participants about machines that the plant is producing that answer the problems that face the whole collective of plant workers and engineers. He especially emphasized the necessity for the builders' participation in improving the design of machinery made by the plant, especially for its effective use at construction sites.

The plant has undertaken series production of new multiple-speed IE-1801A and IE-1806 mobile machine tools for boring mounting holes in reinforced concrete with trepanning drills. The IE-1801A received gold and silver medals of the VDNKh SSSR [USSR Exhibition of Achievements of the National Economy] at the Stroydormash-81 international exposition.

The pneumatic punches developed by the Novosibirsk Institute of the Siberian Department of AN SSSR [USSR Academy of Sciences] and produced by the Odessa plant are well-known here and abroad. As is known, use of the pneumatic punches is especially effective in the trenchfree laying of utility and service lines. And, despite the fact that the plant has produced tens of thousands of pneumatic punches of various models, their use is being hampered. The reason is that workers' cadres have not been trained to service these machines competently. The concentration of pneumatic punches in specialized brigades and sections is an effective path to their wide introduction in construction.

Examples of this are Glavnovosibirskstroy [Main Administration for Construction in Novosibirsk Oblast], where for many years a specialized section for pneumatic punches has been operating successfully, and Glavmospromstroy, which five years ago created State Construction and Installing Association No 1 for the integrated use of pneumatic punches in construction. Scientific and technical collaboration of specialists of GSMO-1 [State Construction and Installing Association No 1] of Glavmospromstroy and of the Odessa Construction-Finishing Machine Plant and of scientists of the Mining Affairs Institute of the Siberian Department of AN SSSR confirmed the desirability of concentrating pneumatic punches in sections for small mechanized equipment.

A. V. Besschastnyy, chief mechanical engineer of GSMO-1, emphasized in his address also the economic desirability of concentrating small mechanized equipment in specialized sections, of using integrated mechanization for labor-intensive manual processes, and of insuring engineering preparation for operations, with a view to developing designs for performing work under which, based upon specific amounts and types of operations, it will be possible to determine by calculation the optimal requirement for small mechanized equipment that will provide for an appreciable reduction in labor expenditure.

He further told the participants that back in the 1960's specialists of Mosstroy-9 [Moscow State Construction and Installing Trust No 9] (currently State Construction and Installing Association No 1 of Glavmospromstroy), in close collaboration with VNIIAlmaz scientists, widely used at a construction project a diamond drill for mounting holes in reinforced concrete. The start of the intensive use of diamond tools in construction and the development of a new technology which had come to replace traditional methods was set.

Many years of experience in the large-scale use of diamond tools confirmed the desirability of concentrating it in specialized brigades and sections. The cost-accounting section of Glavmospromstroy's GSMO-1 developed on an ascending line--from a large specialized brigade, numbering 15 men, to a section with its own set of books and an annual construction and installing work plan of 1.3 million rubles. The journal has already reported on the section's characteristic features.*

Diamond tools and installations are now being used especially effectively for rebuilding and reequipping (see table).

At the cost-accountable section's training ground, seminar participants were shown the operation of new tools of various designs, which will enable practically all erecting holes which are encountered in construction-work practice to be made.

Attention was called to the new two-speed IE-1801A machine tool, which is produced in series by the Odessa SOM [Construction-Finishing Machine] Plant. The main advantages of the IE-1801A machine over the IE-1801 are: a halving of the weight and improvement of the kinematics, and it is equipped with a two-speed gear box.

Specifications of Machine Tool IE-1801A

Drill diameter, mm:	
Maximum	125
Minimum	50
Drilling depth, mm	Up to 500
Drilling angle	At any angle
Rotating frequency, rpm	850/1,350
Power of the electric motor, kw	2.2
Voltage	220
Dimensions, mm	700x500x1,400
Weight, kg	100

*MEKHANIZATSIYA STR-VA [Mechanization of Construction], No 2, 1984.

Technical and Economic Indicators of a Cost-Accountable Section at the Capital's Largest Construction Projects

Project	Diameter of mounting hole, mm	Depth of mounting hole, mm	Total number of holes drilled	Total length of holes drilled, meters	Savings of labor, material and power resources			
					Labor, man-hours	Electricity, kw-hr	Liquid fuel, liters	Lumber, m^3
Serp i Molot Plant.....	20-100	500	23,455	1,173.5	10,118	604	6,000	7
Motor Vehicle Plant imeni Likhachev.....	20-160	350	45,416	1,076.1	22,523	1,211	10,500	13.6
Motor Vehicle Plant imeni Leninskiy Komsomol.....	20-160	480	14,486	5,070.1	7,177	453	3,000	4.3

The section is equipped with new model 110, 150, 200 and 313 Diafor machine tools for drilling various holes 20-260 mm in diameter to a depth of 300 to 1,000 mm. These machine tools weigh from 21 to 100 kg.

The D-15YeS concrete-cutting machine with a segmented diamond cutting disk 1,000 mm in diameter was demonstrated. The cutting depth is 420 mm, and the cutting speed is 20-30 cm/min.

As with the diamond section, the administration created a section for the comprehensive use of pneumatic punches and a specialized section for vibrator vacuuming, which was equipped with the appropriate, efficient equipment, truck-mounted concrete pump and concrete-mixing trucks.

A hydraulic rock-splitting wedge unit, new in world practice, was also shown in action to the seminar's participants. In mere seconds the installation's five hydraulic cylinders destroyed a reinforced-concrete footing (granite aggregate, M300-grade concrete) reinforced by steel bar 15 mm in diameter in a 120x120 mm grid. Each hydraulic cylinder develops a pressure of more than 500 atmospheres, and a force of 270-500 tons-force is transmitted to the walls of the hole, which is first drilled to a depth of up to 750 mm. Labor expenditure for destruction is reduced 15-fold to 25-fold compared with traditional methods, and diamond-tool consumption is reduced 75-fold.

With a view to further reducing manual-labor expenditure and to increasing labor productivity at Moscow and Moscow Oblast construction projects by widely introducing mechanized tools, construction-finishing machines and other small mechanized equipment, the seminar's participants considered it necessary to recommend to the main construction administrations of the Mosgorispolkom and Mosoblispolkom [Moscow Oblast Ispolkom] and other construction organizations and agencies that they complete in 1984-1985 the concentration of small mechanized equipment in accordance with the basic principles of the tasks and functions of managing small mechanized equipment in construction; organize everywhere construction-project tool departments in accordance with the statute about organizing the tool activity in construction; provide for the wide introduction of progressive technology and organization of the performance of finishing operations and equip finishing-worker brigades with standard sets of effective small mechanized equipment; organize the manufacture of small mechanized equipment and attachments that are not produced by industry, taking into account the products lists recommended by TsNIIOMTP; and raise the technical feasibility of design solutions with a view to reducing maximally the use of manual labor in doing construction and installing work. These are the introduction of industrialized methods for doing finishing work; the use of progressive structure which excludes manual operations during erecting work; the rational solution of utility and service lines in combination with the constructional structure and the finishing of buildings and structures; and other design solutions which determine a considerable reduction in manual-labor expenditure.

The responsibility of construction-organization chief engineers for the technological level of engineering preparation must be raised, with a view to: using progressive operating processes and effective mechanized equipment; and supplying brigades and teams with complete sets (or standard complete sets) of operating equipment.

Providing for the establishment of a pool of mechanized equipment and of a system for supplying construction and installing organizations in accordance with the amount and structure of the work and the working conditions.

Providing for the effective use of existing mechanized equipment by improving the organization and management of construction operations and organization of the work; by raising the quality of technical servicing and repairs of mechanized equipment; and by raising the skills of equipment drivers and other operators and of the repairmen who service the mechanized equipment.

Creating in Mosgorispolkom, from among construction-organization innovators, a council of innovators, which will examine: specific forms of labor-intensive operations carried out manually and effective mechanized equipment that will provide for replacing manual labor, and progressive technologies and ways of speeding up their introduction into production; and other achievements of scientific and technical progress in construction that will enable a rise in labor productivity and work quality.

UDC 69.003:658.011.8

New Models from Mosstroymekhanizatsiya

Moscow MEKHANIZATSIYA STROITEL'STVA in Russian No 12, Dec 84 pp 12-14

[Article by V. A. Petrushin, engineer and manager of Mosstroymekhanizatsiya [Moscow Trust for the Mechanization of Construction] No 1 of Glavmosstroy [Main Administration for Housing and Nonindustrial Construction in Moscow City]: "What Mosstroymekhanizatsiya Has Introduced"]

[Text] The development of a set of machines, mechanisms and attachments for the construction of hothouse combines.

Glavmosstroy organizations, in carrying out the Foodstuffs Program, have recently sharply increased the number of hothouse combines under construction. Housing Construction Administration No 1 is building hothouse combines at Barvikh, Kolkhoz Vladimir Il'ich and Sovkhoz Moskovskiy. Not only is the number of combines simultaneously under construction growing, but so is their capacity and, consequently, also the amounts of work. Thus, the third phase of the hothouse combine at Sovkhoz Moskovskiy, with a covered heated area of 60 hectares, is the largest in the Nonchernozem belt.

The large amounts of earthmoving work, the short construction time, the seasonality of the work, the weather and the large number of organizations that are building hothouses simultaneously--all these factors have sharply changed the traditional technology for doing hothouse construction work. This has set before Mosstroymekhanizatsiya Trust No 1 the task of creating a special set of machines and attachments for building hothouse combines which will enable earthmoving, plumbing, finishing and other operations to be mechanized.

Mosstroymekhanizatsiya Trust No 1 has designed, produced at its production bases, and put into operation a number of machines and attachments that increase labor productivity and improve the builders' working conditions.

The machines for earthmoving work include:

A sludge-disposal unit based on the TO-7 (D-574) tractor loader (figure 1) with a tank of 1.5 m^3 capacity and a productivity of 10 m^3 or more per hour, using a vacuum method for loading that operates off the basic machine's internal-combustion engine. The operating cycle for loading the tank is 10 minutes.

Demands are high when dumping fill after snow thawing of the soil. Increased moisture of the soil after the snow thaw in the spring or rain in the summer is a factor which determines the possibility of doing earthmoving work at a job. Natural drying of the soil, especially in an area of water lenses and puddles, is a lengthy process which often delays the start of the earthmoving work of filling and soil compaction by several days. This is extremely undesirable where earthmoving work is highly seasonal.

Figure 1. Sludge-Disposal Unit.

The sludge-disposal unit provides for the forced collection of water from the surface of the site and the discharge thereof into ditches or water-runoff systems, so that earthmoving can be undertaken literally within a few hours after a rain. The crawler chassis of the sludge disposal unit permits any point of the site to be worked. Water, sludge or soil and water can be discharged from the tank by the delivery thereof to selected places through manholes or through built-in hoses to a storage tank where the lifting involved is not large.

During the construction of hothouses at Sovkhoz Moskovskiy, the sludge disposal unit showed high productivity. The annual economic benefit from introducing the unit was 5,600 rubles.

Hole drillers based on the DT-75 tractor (figure 2) with a drill diameter of 460 mm and a drilling depth of 1.7 meters have found wide use during the construction of hothouses. The hole driller enables up to 150 m^2 of blasthole drilling per shift.

The hole drillers were produced on a DT-75 tractor base, using operating equipment based on the BKGM-63-2 drilling machine.

The unusual lightness in weight of the design, adequate off-the-road capability, simplicity of controlling the working implement, reliability and high productivity have created a machine with great popularity among the builders (the machine can be used in all fields of construction). The annual economic benefit from introducing the hole driller was 7,500 rubles.

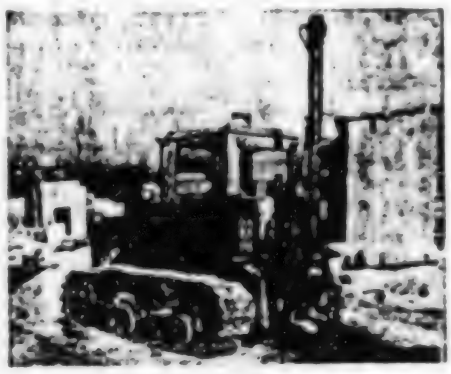


Figure 2. Hole driller.

After laying the footings for hothouses, an important operating aspect of their construction is that of microleveling the site, without which it is practically impossible to undertake drainage-system construction.

In order to identify the high places during microleveling of the soil for hothouses, a special monitoring instrument (figure 3 [photo not reproduced]) was created, using a machinebuilders' level and a movable rod with a colored indicator. Measurements can be made with the instrument during microleveling at an interval of 1.5x3 meters with a precision of reading of 1 cm. The base of the instrument's reading is the mounting pin of a foundation post for the hothouse.

During construction of Sovkhoz Moskovskiy, tens of hectares of the site were microleveled. The annual economic benefit from its introduction was 800 rubles.

An experimental model of a mobile unit based on the K-701 wheeled tractor (figure 4) for compacting soil was tested successfully.

After microleveling of the site is completed, it is sometimes necessary to do fine compacting of the soil in places with little fill. Where the footings (or posts) of the hothouse have been erected, this work is done by a vibration roller based on the K-701 tractor.

Figure 4. Soil-Compacting Unit.

The unit uses the D-480 vibration roller, on which the D-37 engine has been replaced by the 210.20 hydraulic motor. The vibration roller is controlled remotely from the operator's cab.

The machine's configuration permits soil to be compacted under confined conditions without the danger of damaging the hothouse's footings, the structure of which is extremely brittle. This machine compacts soil of any moisture and density, not only during forward but also during backward motion, given any thickness of the fill layer, and it is marked by high productivity and mobility. The annual economic benefit from introducing the mobile unit was 7,800 rubles.

In order to do earthmoving work inside the hothouse (certain types of drain systems, runoff, and some other operations), special "reverse blade" equipment with changed kinematics and a set of replaceable scoops were fabricated for the EO-2621 excavator. With use of the special equipment, the excavator's size allowed all types of earthmoving inside the assembled hothouse to be performed. The excavator is also widely used for other types of earthmoving not associated with work inside the hothouse. The annual economic benefit from introducing one excavator was 26,700 rubles.

The specifics of building hothouse combines consist in small construction jobs spread out over large areas that have absolutely no artificial covering of any kind for the movement and operation of construction machinery and mechanisms. Therefore the question of creating transport vehicles which can haul sand, gravel and concrete over large soil sites (several tens of hectares) along free-standing footings and other constructional members, of laying this material down in small amounts inside the structure, and of transporting metal structure, equipment, pipe, and so on, in any weather has become very sharp.

Such a special dump truck with a clamshell bucket was created on the basis of a three-axle road tractor (figure 5 [photo not reproduced]), for which purpose the vehicle was equipped with a dump body, the clamshell, and a slinging arrangement. By means of the indicated equipment, the vehicle can load up the dump-truck body with sand, concrete and other types of materials, deliver these materials in small portions within the structure or unload them completely at a definite spot. The vehicle can load itself up with metal structure, pipe and various items of equipment, transport them about the job and unload or erect them at the required places. The vehicle showed high productivity while collecting pile trimmings at hothouses that were being built and removing them from the job. The vehicle was effective for loading up any construction trash and hauling it away. The annual economic benefit from introducing the vehicle was 82,100 rubles.

In order to perform general construction work, a front-end erecting machine was created on the basis of the TO-7 (D-574) tractor loader (figure 6), and it is being used for constructing underground utility and service lines for hothouses (and water drains), when the hothouse's footings and posts have been erected and the use of pipelayers and truck cranes for erecting pipelines is impossible. Thus it became necessary to create a front-end pipelayer with a load capacity of up to 1.5 tons and a set of self-gripping sling attachments for pipe from 50 to 300 mm in diameter, which can work between posts at 3x6-meter intervals.

During hothouse construction, the front-end erecting machine installed several kilometers of drainage lines of various diameters with minimal labor expenditure, the machine not only assembeling the pipe but also delivering it to the erecting site.

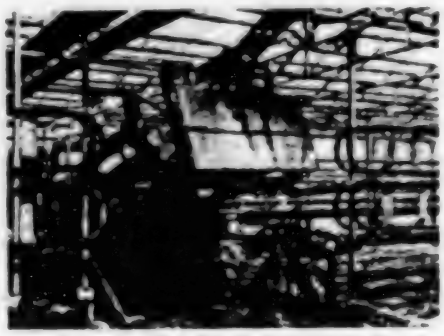


Figure 6. The Erecting Machine.

While building hothouses with the front-end erecting machine, work was done to deliver and erect all the enclosure structure (weight 700 kg) inside the hothouses (this question was practically unsolved until manufacture of the front-end erecting machine), and much work was done in transporting glass inside the hothouse directly to the place of its installation. The annual economic benefit from using the erecting machine was 12,800 rubles.

The substantial amounts of work on glazing hothouses in single modules (370x-450 meters in size) created the problems of transporting the glass in factory packaging (cartons) weighing 500 kg directly to the site of the glazing. Unpackaging the glass before it went to the hothouses and then delivering it to the glazing site in bulk previously caused much unjustified labor cost and glass breakage. The problem was solved through the use of special machines--a front-end erecting machine which is used where there are no roads and has been modernized for transporting glass inside a hothouse--the 4045 forklift (figure 7)--where there are hard-surface paths inside the hothouse. The 4045 forklift was modernized, The forklift has high productivity. Inside a 7.5-hectare hothouse unit, it enables the delivery of glass to several brigades of glaziers. When simultaneously glazing 11 hectares of hothouses, it is necessary to fabricate and use still another vehicle.

All types of the above-examined machines are now on display at the exhibit organized by VDNKh SSSR [USSR Exhibition of Achievements of the National Economy] in honor of the 30th anniversary of the forming of the Order of Lenin Glavmosstroy.

Additional information on the above-enumerated machines and mechanisms can be obtained at Mosstroymekhanizatsiya Trust No 1 at 101442, Moscow, GSP-4, Kalyayevskaya Ulitsa, d. 33.

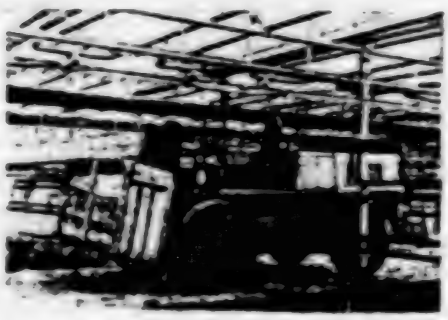


Figure 7. Modernized 4045 Lift Truck.

UDC 621.869.4:629.114.2.004.1

Small Loader Imitated

Moscow MEKHANIZATSIYA STROITEL'STVA in Russian No 12, Dec 84 pp 14-15

[Article by Doctor of Engineering Sciences Yu. I. Belyakov, Engineer L. S. Chebanov (KISI [Kiev Institute of Construction Engineering]), and Engineer A. Ye. Nikolayev (Mostransstroy [Moscow Construction and Installing Trust for Transport Construction]): "Small Loaders--Operating Experience and Prospects"]

[Text] Single-bucket loaders of 3-ton (TO-18 and TO-25) and 2-ton (TO-6A) capacity, which have been used widely in various fields of construction, are now being produced serially in our country. However, tests indicate [1 and 2] that the use of these loaders in confined spaces for construction and installing work and for rebuilding industrial enterprises is limited.

Under these circumstances it is desirable to use small general-purpose "bobcat"-type loaders. Thanks to their high mobility and maneuverability and to the availability of replaceable implements, such loaders can work successfully in confined spaces, where the use of large machines would be difficult or even impossible.

Small loaders consist of monobloc frame, welded and formed by two box-type longerons, a diesel or carbureted engine, a hydraulic displacement transmission, final drives, the operating equipment and control systems, and the cab, which is located between the boom longerons [3 and 4]. The structural scheme for these machines differs basically from that of loaders used in our country, which have rigid and articulated-joint frame. All the wheels are steerable, thanks to which side turning of the loader around its center of gravity is possible. In so doing, the left and right wheels are rotated in different directions. For turning around on the wheelbase's turning radius, to the right, for example, the right wheels are stopped, and only the left ones rotate. The boom is hinged to a pedestal, which is located in the rear part of the loader.

Small loaders are produced widely abroad (up to 30,000 per year). The serially produced UNC-050 loaders have been tested in the USSR and soon will be

shipped from the ChSSR [Czechoslovak Socialist Republic]. It is planned to produce such machines in our country also in the near future [5]. The positive experience in the operation of small foreign loaders by our country's construction organizations is of interest.

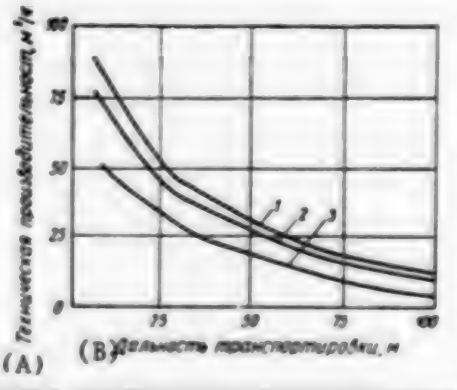
For example, Mostransstroy Trust is successfully using two small loaders--the LANZ-50 and GEHL-4610 (FRG)--for rebuilding the Pavelets station.

The loaders worked with various toolbar equipment items (the basic scoop, excavator equipment, reverse blade, loading forks, and hydraulic hammer) and they have shown, in so doing, fairly high productivity (figure 1).

Figure 1. Technical Productivity of Loaders for Transporting Soil Over Various Distances.

1. UNC-060.
2. LANZ.
3. GEHL-4610.

A. Operating productivity, m^3/hr.
B. Transporting distance, meters.



The hydraulic hammer (figure 2) is used especially often, practically eliminating manual labor during spreading (by destroying bulky lumps of constructional-structure rubble, road members and toppings, and so on).

In some cases a drill for making holes up to 1 meter deep for vertical posts, a worm implement for laying narrow trenches (up to 250 mm), a brush-type snow sweeper, and other items have been hung on it.

The area of application of small loaders is greatly expanded by the use of replaceable implements, and their utilization per shift is increased. Such loaders are practically never idle, their utilization coefficient being K_B = 0.7-0.8.

Figure 2. Small Loader with Toolbar Hydraulic Hammer.

In arranging a foundation pit for the main building of the railroad station, the confined environment prevented the laying of an access path. Therefore, most of the earthmoving was done by dragline excavator, and the foundation was brought to the designed grade--by the loader. In the foundation pit, the loader transported and loaded soil into buckets, which were then removed by a crane. After these operations were completed, the loader was used to deliver sand for the arrangement of a sandy mat for the footing. In so doing, the preliminary (coarse) leveling was done by the bottom of the bucket.

During repair of a bridge in the Nizhniye Kotly region, the GEHL-4610 loader did practically all the labor intensive work. Frozen ground was ripped up by the hydraulic hammer, and reinforced-concrete structures that had been destroyed was loaded into dump trucks with the basic scoop.

During the unloading of freight cars with brick at a UPTK [Production-Equipment Outfitting Administration] trust, loading forks were mainly used. For unloading brick rubble, the basic scoop was installed.

Experience in the use of small loaders equipped with replaceable implements for many specific purposes indicates that they do loading, unloading, earthmoving-transport, erecting and auxiliary operations with adequate effectiveness. They are used especially successfully in a cramped construction environment. Therefore, when mastering the serial output of domestic small loaders, the problems of supplying them with these implements must be resolved.

BIBLIOGRAPHY

1. Belyakov, Yu. I. and Chebanov, L. S. "Research of the Potential for Using Loaders During the Rebuilding of Industrial Enterprises." In the book, Problemy rekonstruktsii promyshlennykh predpriyatiy [Problems of Rebuilding Industrial Enterprises]. Kiev, NIISP [Scientific-Research Institute for the Construction Industry], UkSSR Gosstroy, 1983.

2. Belyakov, Yu. I., Galimullin, V. A., Ovcharenko, V. A. and Chebanov, L. S. Zemlyanyye i burovzryvnyye raboty pri rekonstruktsii predpriyatiy. Uchebnoye posobiye. [Earthmoving and Blasthole Operations During the Rebuilding of Enterprises. A Teaching Aid]. Kiev, KISI [Kiev Institute for Construction Engineering], 1983.

3. Bazanov, A. F. and Zabegalov, G. V. Samokhodnyye pogruzchiki [Self-Propelled Loaders]. Moscow, Mashinostroyeniye, 1979.

4. Dzil'no, A. A. and Polyanin, V. A. "Small General-Purpose Loaders with Side Turning." STROIT. I DOR. MASHINY [Construction and Road Machinery], No 7, 1983.

5. Vasil'yev, A. A., Voynich, L. K. and Lapin, B. Ya. "The Main Directions for Developing Front-End Loaders." STROIT. I DOR. MASHINY, No 5, 1983.

UDC 622.233.62:658.589

Mobile Earth Drilling Rigs

Moscow MEKHANIZATSIYA STROITEL'STVA in Russian No 12, Dec 84 pp 15-16

[Article by Engineer P. I. Nikitenko (Minsk's NPO [Science and Production Association] Dormash): "A Modernized Series of Crane-Drilling Machines"]

[Text] Alapayevsk's Stroydormash plant serially produces the BM-205, BM-302A and BM-305 crane-drilling machines, the documentation for which was worked out by Minsk's NPO Dormash. These machines have proved themselves well at work, being maneuverable, reliable in operation and highly productive, they enjoy great demand on the part of the customers, and they are being exported. A decision of the State Certifying Commission awarded the BM-205 and BM-302A the State Emblem of Quality.

These vehicles are being constantly improved in design. The Dormash Association, jointly with the Stroydormash plant, has successively modernized a number of crane-drilling machines. Test models of the modernized machines have been tested and proved themselves ready for series production.

Documentation on the test model of the BM-205B, which called for toolbar crane-drilling equipment on the MTZ-82 tractor with unified cab, was developed and sent to the plant.

Drilling machines (figures 1-4) mounted on basic motor vehicles and tractors were intended for drilling vertical and sloped holes for supports in thawed and seasonally frozen category I-IV soils. They can be used for building and repairing power transmission and communications lines, in industrial and nonindustrial construction, for drilling holes for fence posts, footings and road signs, and for setting out trees and shrubbery.

Specifications of the Machines

Indicator	BM-205A	BM-302B	BM-305
Basic machine.....	MTZ-82L tractor	GAZ-66-02 truck	DT-75 MV-R-S2 tractor
Maximum drilling depth, m	2	3	3
Drilling diameter, m.....	0.36, 0.5, 0.63, 0.8	0.36, 0.5, 0.63, 0.8,	0.36, 0.5, 0.63, 0.8,
Drilling angle, degrees.....	60-102	62-95	62-98
Drill-tool rotating frequency, rpm ..	121-210	110-205	102-177
Time for drilling hole 0.5 in diameter to full depth and for installing a support, min.....	13.8	16.6	13.5
Lifting capability of the crane, t ..	Up to 1.25	Up to 1.25	Up to 1.25
Maximum length of supports installed, m.	10	12	12
Additional equipment.....	Bulldozer	-	Bulldozer
Dimensions in transport mode, mm	6,080x2,240x 3,720	6,600x2,350x 3,350	6,960x2,560x 3,350
Design weight, tons.....	5.46	5.4	8.7

A modernized model of the BM-302B crane-drill has already been described.* The BM-205 and BM-305 were modernized also, for the purpose of increasing reliability, productivity and reduction in labor intensiveness of technical servicing.

On the whole, all the component parts of the machines have been unified to the maximum. For example, in the transmission, the power take-off for the winch and the Cardan shaft are identical; and in the hydraulic drive, the hydraulic cylinders of the extension supports, the hydraulically operated lift, the hydraulic control valve, the throttles and other apparatus are identical. The drilling tool, the feed mechanism (drill rod), the slope and angle-of-drilling indicator, the rotator, and the slinging arrangement are completely unified.

The machines supply drive for rotating the drilling tool from the basic vehicle's engine by means of a transfer case, a Cardan shaft and a rotator. The feed to the face of the hole and extraction are performed by the hydraulic

*STROITEL'NYYE I DOROZHNYYE MASHINY [Construction and Road Machines, No 1, 1983.

Figure 1. Drilling Machine BM-205A.

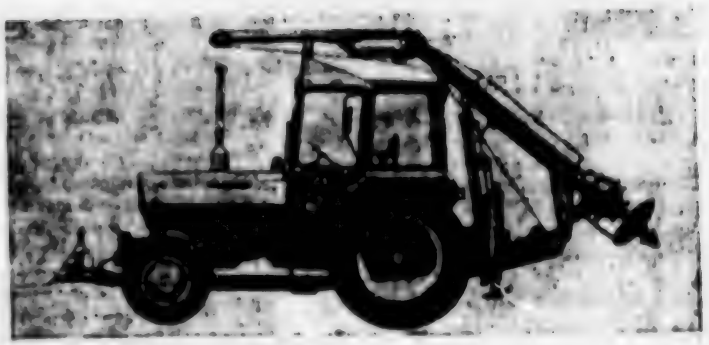


Figure 2. Drilling Machine BM-205B.

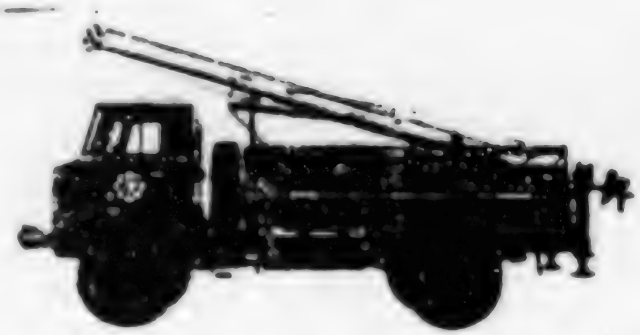


Figure 3. Drilling Machine BM-302B.

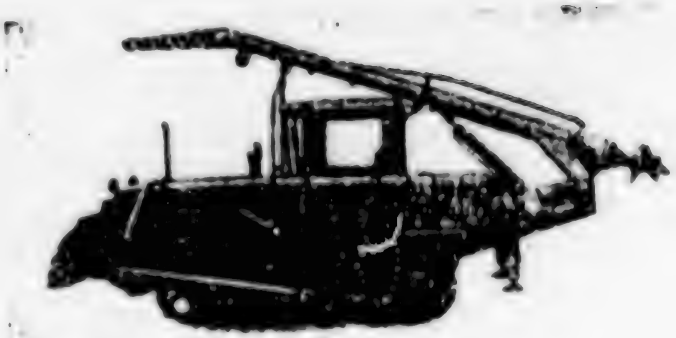


Figure 4. Drilling Machine BM-305A.

rod. The crane mechanism serves for installing the supports in the drilled holes and for performing other lifting work. Drilling depth is monitored by a rule with an indicator, which is located on the support pipe of the drilling equipment.

The modernized machines have a number of advantages over their predecessors. The reliability of the transmission has been increased by use of a conical hypoidal gearing in the design of the rotator and by an original solution for the mud-removing component. The rod, hydraulic lift and the welded frame structure have been reinforced. In particular, a single frame has been installed in the BM-305A machine instead of swiveling and nonswiveling frames. This has enabled the design to be simplified and the hydraulic cylinders for swiveling, the hydraulic control device, and many pipelines to be eliminated, as a result of which the machine's weight has been greatly reduced.

On the whole, it should be noted that by making the design improvements and by simplification and unification, the machine's reliability has been greatly increased. Average service life has been brought up to 6,000 engine hours. Productivity has been increased and the labor intensiveness of technical servicing reduced. The annual economic benefit from introducing the BM-205A is about 800 rubles, the BM-302B 1,000 rubles and the BM-305A 500 rubles.

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CSO: 1821/042

CONSTRUCTION METHODS AND MATERIALS

SLOW ACCEPTANCE OF SYNTHETIC AGGREGATES NOTED

Tashkent EKONOMIKA I ZHIZN' in Russian No 9, Sep 84 pp 46-48

[Article by Candidate of Economic Sciences T. Rakhminova of the Tashkent Institute of the National Economy: "Light Materials and Structural Elements Into Construction"]

[Text] Industrialization, being the basic idea in technical progress in construction, is aimed at converting construction into a fully mechanized flow process of assembling and installing buildings and structures by using large-size standardized elements, assemblies and units with a high degree of plant prefabrication.

Construction from large-size elements with complete preassembly of bearing and partition elements has trebled over the last decade and in terms of growth rate has outstripped by more than 1.8-fold the growth in the volume of construction-installation work. As a result of this the proportional amount of prefab construction in the total value of construction work in 1980 was 27.5 percent. By the end of the five-year plan, the level of prefab construction in the republic [Uzbekistan] should rise to 34 percent.

However, the problem of industrializing construction consists not only in increasing the level of its prefabrication. Technical progress presupposes solving this on an integrated basis by converting to the mass introduction of light materials and elements. Precisely in utilizing such building materials lies the realization of the other major direction for technical progress in construction, namely a reduction in the weight of the erected buildings and structures.

With the conversion of construction to an industrial basis and with the increase in the level of plant prefabrication of the elements and parts, the share of expenditures is increased on material resources in the cost structure of construction-installation work and the coefficient for the internal circulation of products at the building materials and structural elements enterprises also rises. Under these conditions a decline in the cost, material and labor intensiveness as well as a reduction in construction times to an ever-increasing degree depend upon the quality indicators for the work of the building materials industry and the effectiveness of the product produced by it. For this reason, in keeping with the further development of the processes of industrializing construction, the product assortment of the building materials industry and the

other sectors of the material base of the construction complex will more and more change in the direction of increasing the output of effective types of materials, parts and elements which bring about a rise in metal intensiveness, cost and labor intensiveness of construction, the weight of the buildings and structures in addition to an increase in their insulating.

Porous aggregates hold an important place among such materials. Their use reduces the weight of the projects being erected, it lowers cement and metal construction and reduces the estimated construction cost and labor expenditures as well as transport outlays. Construction is a materials-intensive sector of material production. A reduction in the weight of building materials and structural elements substantially reduces the amount of freight shipments, it frees the means of transport and reduces labor expenditures on loading and unloading work.

The use of porous aggregates makes it possible to increase the size of structural elements without increasing the load capacity of transport and installation equipment. Light elements provide an opportunity for the mass conversion to mechanizing installation work.

Under the conditions of our republic, where capital construction is carried out in seismically active areas and areas with subsiding ground and aggressive ground water, the development of the production and the use of artificial porous aggregates assume particularly important significance. As is known the carrying out of antiseismic and antisubsidence measures requires additional labor and material resources which increase the estimated cost of construction, respectively, by 2-3 percent in seven-point areas, by 4-6 percent in eight-point ones and 7-12 percent in nine-point ones. The additional antisubsidence measures increase the estimated construction cost by another 2-6 percent. Thus, the overall increase in the construction costs, in comparison with the nonseismic and nonsubsidence areas, is an average of up to 18 percent. Under these conditions the use of porous aggregates which possess high strength and seismic resistance as well as, most importantly, helping to reduce the weight of the erected projects, makes it possible to significantly reduce the gap in construction costs under ordinary conditions and the conditions of seismic-resistant construction on subsiding ground. According to our estimates, in Uzbekistan the replacing of each square meter of enclosure structure from heavy concrete by an analogous element of a light one based on artificial porous aggregates provides a savings of up to 8 rubles and in comparison with elements from fine-piece materials up to 12 rubles.

The republic's need for artificial porous aggregates is only 42.5 percent satisfied. Moreover, the supply of republic capital construction with porous aggregates has been dropping (over the period from 1970 through 1980 by 33.8 percent), and significant disproportions between demand and production are observed virtually in all zones of concentrated construction. For example, in the Surkhandarya zone, the supply of own-produced porous aggregates is 5.6 percent, Karakalpak is 13.1 percent, Samarkand 36.3 percent and Bukhara 57.8 percent; in Andizhan, Namangan, Syrdarya, Fergana and Khorezma which are responsible for around 30 percent of the total volume of construction-installation work done in the republic, there has been no development of an artificial porous aggregates industry.

At present, the production of artificial porous aggregates, as organized at 12 republic enterprises, is concentrated in six ministries and departments of Union and Union republic levels. The absence of a unified development plan for the sector, a standard technical policy and the localist desires of the ministries and departments to have their own production facilities have led also to irrational and long shipments, to the underutilization of production capacity, to the disproportion in production to demand in the individual oblasts and to the creation of an artificial shortage in some areas with an unjustified surplus in others.

The sector's structure is still imperfect. Regardless of the existing potential and the advisability of organizing the output and use of new, more effective types of porous aggregates, for example, from industrial wastes, at present the republic produces only haydite and aggloporite. Haydite is responsible for over 85 percent of the total output of porous aggregates. For comparison we would point out that as a whole for the nation, the range of artificial pourous aggregates is much more diverse and, along with the traditional porous aggregates, there has been extensive development of schungisite, expanded perlite, slag pumice, ash gravel, vermiculite and others.

The development of the artificial porous aggregates industry still lags behind the demands of technical progress in capital construction and the building materials industry. This lag is primarily apparent in the low technical level of production. The enterprises are not only poorly provided with modern equipment but at many of them the operating equipment and units are very old and obsolete. This causes frequent breakdowns and stoppages of the old equipment and, as a consequence, high expenditures on maintaining it in working order. Here there is an inevitable rise in product costs and this tells negatively upon the end results of enterprise operations.

The extensive use of artificial porous aggregates in construction to a significant degree is also impeded by their poor quality. In terms of their quality characteristics, the artificial porous aggregates should combine sufficient strength with minimal volume weight. In recent years the quality of the porous aggregates in the republic as a whole has somewhat improved, however at a number of enterprises (Dzhuma, Barrazh quarries, the N.kus KZU [expansion unknown] No 20 and the Bukhara KZU No 12) this is on the level of the lowest building materials permitted by the State Standards and production, for example, of the most efficient haydite with a volume weight of 300-450 kg per m^3 in the republic is completely lacking, while for the nation as a whole this is 30-35 percent.

Because of the poor quality of the artificial porous aggregates, at present only one-fifth of them is employed for producing prefabricated elements. Because of this the proportional amount of the elements and parts made from artificial porous aggregates in the total volume of prefabricated reinforced concrete is extremely insignificant, 10.4 instead of the required 24 percent.

In addition, the very structure of the light-concrete elements is also far from perfect. As is known, the most diverse elements can be produced in artificial porous aggregates from insulating enclosures to high-strength bearing ones. At present, in Uzbekistan artificial porous aggregates are used only to manufacture insulating and structural-insulating concretes for outside enclosing wall

elements for residential, industrial and agricultural buildings. Even so, the high volume bulk weight of the porous aggregates as well as the lack of production of porous sand in the republic do not always make it possible to manufacture the enclosure elements with the required weight indicators. As for the use of artificial porous aggregates in producing bearing elements, this as yet has not started. At the same time, as numerous research shows, precisely the integrated use of the porous aggregates both in enclosure and bearing elements ensures the realization of all the technical and economic advantages of the light materials.

The objective need of the republic economy for the sector's products can be established on the basis of the economic effectiveness of organizing production and employing the artificial porous aggregates in the various zones of concentrated construction, considering the regional features of each zone, the presence of raw material sources and the development prospects of capital construction. This factor is very important, since the porous aggregates are a strictly local building material. For this reason, the technical and economic indicators for the production and use of the porous aggregates can change significantly for the individual construction zones. The results of the calculations made show the advantage of the light-concrete elements over other elements virtually throughout the republic. Thus, the adjusted expenditures per m^2 of single-layer aggloporite panels are 35-60 percent lower than for analogous elements from fine-piece materials and 40-45 percent lower than the three-layered reinforced concrete panels; the adjusted expenditures per m^2 of single-layer haydite-concrete panels are respectively 5-30 percent lower than for elements from fine-piece materials and an average of 10 percent lower than for elements from heavy concrete.

Nevertheless, the potential for the effective use of porous aggregates in our republic is still far from fully utilized.

Among the measures which would help to further increase the economic effectiveness of the porous aggregates, a crucial role is played also by increasing the technical level of the sector, further improving the equipment and production methods, bettering the organization of production and labor, developing the production of new, more progressive types of porous aggregates such as camporite, clay-ash haydite, ash gravel and ash aggloporite.

This would make it possible, without additional expenditures, to produce another half million m^3 of artificial porous aggregates.

An important factor which would raise the effectiveness of artificial porous aggregates is their integrated use not only in enclosure but also bearing elements.

As a result of the development of the production and the use of the artificial porous aggregates in the republic, an economic effect amounting to 25 million rubles could be obtained.

10272
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CONSTRUCTION METHODS AND MATERIALS

NEW METHOD OF UNDERGROUND WALL CONSTRUCTION

Moscow MOSKOVSKAYA PRAVDA in Russian 7 Feb 85 p 2

[Article by A. Revzin: "A Wall Under the Ground"]

[Text] When building foundations or laying tunnels, construction workers are often faced with weak and unstable soil that is also saturated with water. In order to work at a steady pace it becomes necessary to hold the soil in place and battle against the water with the aid of every conceivable techical contrivance. Construction workers call waterproofing structures anti-seepage screens. This work is complicated and labor consuming and that means that it is expensive. How can the workload for the construction personnel be lightened and made more efficient?

About 10 years ago a new method appeared for battling ground water. A small self-propelled device bores a hole. A monitor is lowered into it that makes a guided stream of water in an air-filled membrane. This membrane allows the stream to maintain its pressure at a significantly large distance. Under atmospheric pressures in the tens and even hundreds the water crumbles the ground and forms a fissure in it with a width of 15 centimeters on the average. A cement and clay mortar mixture is simultaneously fed into the fissure. The monitor is slowly raised. And a wall with a length of up to 5 meters is formed below ground. This method, which has received the name of stream technology, has begun to be used in different countries. It is of interest to us at the Hydraulic and Special Design Institute as well. And not simply of interest....

After eight years of operation ample experimental material has been obtained. The technology has been tested under various conditions. The optimum conditions for forming underground walls were sought by changing the pressure of the water or the composition of the mortar. And today the new technology is already being used more actively all the time in practice. What are the advantages of it?

An anti-seepage screen was erected during construction of the Zagorsk Hydroelectric Storage Power Station. It was built by using stream technology. It proved to be substantially cheaper and was built more quickly than usual.

Closed underground walls can also be built. When this is done a pit of any shape can be obtained that is safely protected from ground water. For

example, columns with a diameter of about 2 meters will serve as a LEP [electric power line] support, a foundation for housing units or when erecting small bridges. They are built by raising and simultaneously turning the stream in a circle.

And so stream technology is required both as protection against ground water and to build foundations. And here is another important area: land reclamation. The stability of the harvest depends, as is we all know, on the whims of the weather--at times it rains and at others there is not a single cloud in the sky. This especially affects zones that have fluctuations in moisture. The solution is found in artificially irrigating the fields. But plants only use a very small portion of the regenerative moisture. The major portion goes irretrievably into the ground.

Retention irrigation is used--ground water is maintained at the natural level. However, when this is done moisture does not always reach the roots of the plants. Anti-seepage screens that are built by stream technology may be suitable here also.

Certainly, the new method has limitations. It can only be used in certain soils: in sand, mud, and loess since they are most easily hollowed out by water. In addition, a cement and clay foundation will not support relatively large loads--it is not reinforced concrete. But the economic expediency of it is sufficiently evident in the examples given.

And yet the scale at which this innovation is used still does correspond to its value and effectiveness. What then is impeding the extensive adoption of stream technology in construction? What is hindering conducting experiments on an industrial scale? There is a paradox in the method of evaluating construction efficiency that exists now; the more expensive a construction project is the more advantageous it is to construction workers. And one other thing--interdepartmental obstacles (how much has already been written about that!). They do not especially want other specialists to introduce "foreign" developments if they are engaged in solving similar technical problems themselves. Maybe a "team" of the above organizations in the construction industry is needed?...

9495
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CONSTRUCTION METHODS AND MATERIALS

BRIEFS

NEW BUILDING MATERIAL--A new shop became operational at the Shevchenko Plastics Plant. A new building material--polysulfone--has been derived for the first time in the country here at an experimental industrial installation by technology developed by plant specialists together with Moscow scientists. "Polysulfone," says Chief Plant Engineer, Ye. Usov, "can be used successfully in various sectors of the national economy. The new material has broad applications in machine building, for example, as a substitute for metal. For polysulfone possesses great physical and mechanical properties. They maintain them under temperatures ranging from minus 100 to plus 170 degrees. The new material is not destroyed from shock loads and possesses great strength." [By KAZAKHSTANSKAYA PRAVDA correspondent I. Rodionov in Shevchenko] [Text] [Alma-Ata KAZAKHSTANSKAYA PRAVDA in Russian 4 Dec 84 p 1] 9495

NEW ENGINE--An electric engine with a power of 3,000 kilowatts was built at the Lys'va Turbin and Generator Plant. This machine will be turned out in serial production this year but the enterprise will not obtain a single additional kilogram of metal for it. The entire increase in the production of electric engines and turbine generators was provided by the collective by means of economizing ferrous and non-ferrous metal. [By R. Trusov in Lys'va, Perm' Oblast] [Text] [Moscow KRASNAYA ZVEZDA in Russian 9 Feb 85 p 1] 9495

NEW HIGH-STRENGTH CONCRETE--New technology to obtain concrete that has higher strength, thermal resistance and sets faster has been developed at the Tashkent Highway Institute. During manufacturing the demand for materials, labor expenditures and energy are lower. The use of this technology throughout the country as a whole would make it possible to save up to six million tons of cement which would be the same as putting an additional three or four plants into operation, the construction of which would require 300 to 400 million rubles. The innovation was of interest to specialists from a number of socialist states. This example of effective scientific research was given at a conference of specialists from member-countries of SEV [Council for Mutual Economic Aid] with the topic "Physical and Mechanical Characteristics of Concrete" which opened 22 January in Tashkent. It is being conducted in accordance with the operating plan of the SEV Standing Commission for cooperation in the field of construction. Representatives fron Hungary, the GDR, Poland, the Soviet Union and Czechoslovakia are taking part in the work

of the conference. Over the course of three days they will discuss urgent problems in the use of effective types of concrete, economizing cement while simultaneously increasing its strength and durability and other important problems; expertise on joint work will be exchanged and collaboration in this area is broadening. [UzTAG--Uzbek Telegraph Agency] [Text] [Tashkent PRAVDA VOSTOKA in Russian 23 Jan 85 p 2] 9495

STEEL PRODUCTION CYCLE RENOVATED--The schedule for the output of non-standard steel in the workshift log at the Karaganda Metallurgical Combine has become unnecessary. Discontinuation of production of low-grade metal was aided by the introduction of an automated complex of units in steel-casting production. They feed powdered lime and oxygen into a converter in precise doses where the mixture neutralizes phosphorus, sulphur and other ingredients that reduce the quality of the smelted products. Specialists from the Kazakh Steel Components Trust installed the complex equipment in just 22 days without stopping the continuous primary production cycle. But they prepared for this important operation for many months. After using the large-unit method of installation, each assembly was checked on testing units. They prepared all utility lines and erected a special shop for lime-dust stores in advance. This made it possible to rebuild the converters to turn out high-quality steel ahead of time. It is expected that the output of products in the highest category of quality will reach 17.5 percent of the total volume by the end of the five-year plan at the flagship of Kazakhstan's heavy industry thanks to renovation of the technological cycle. The remainder of the metal being produced will be in the first category. [KazTAG--Kazakh Telegraph Agency] [Text] [Alma-Ata KAZAKHSTANSKAYA PRAVDA in Russian 6 Feb 85 p 1] 9495

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